

In the Claims

This listing of all claims will replace all prior versions, and listings, of claims in the application:

1. (Previously presented) An integrated paper having active particles immobilized therein, said integrated paper comprising of:

a plurality of fibrillated fibers immobilized within said integrated paper, said fibers fibrillated at a temperature greater than about 30°C, wherein said fibrillated fibers have an average fiber diameter of less than about 1000 nm;

active agents immobilized within said integrated paper, said active agents selected from the group consisting of metals, metal salts, metal oxides, alumina, carbon, activated carbon, silicates, ceramics, zeolites, diatomaceous earth, activated bauxite, fuller's earth, calcium sulfate, titanium dioxide, magnesia, magnesium hydroxide, magnesium oxide, manganese oxides, iron oxides, perlite, talc, clay, bone char, calcium hydroxide, calcium salts, or combinations thereof; and

a microbiological interception enhancing agent on at least a portion of at least some of said fibrillated fibers and/or said active agents immobilized within said integrated paper, such that, said microbiological interception enhancing agent is also immobilized within and resides throughout said integrated paper, said microbiological interception enhancing agent comprising a biologically active metal precipitated with a counter ion of a cationic material that is residing on said at least portion of said fibrillated fibers and/or said active agents that are residing

19 within and throughout the entire thickness of said integrated paper to form a
20 colloidal metal precipitate within and throughout said integrated paper that are on
21 a surface of said at least portion of said fibrillated fibers and/or said active agents,
22 wherein said integrated paper has a mean pore size of less than or equal to about 2
23 microns.

24 2. (Original) An integrated paper of claim 1 wherein said fibrillated fibers comprise
25 Lyocell.

1 3. (Previously presented) An integrated paper of claim 2 wherein the lyocell has an
2 average fiber diameter of less than about 400 nm.

1 4. (Previously presented) An integrated paper of claim 1 wherein said active agents
2 have an average particle size of less than or equal to about 1 micron to about 5000
3 microns.

1 5. (Original) An integrated paper of claim 1 wherein the average diameter of said
2 fibrillated fibers is less than an average particle size of said active agents.

1 6. (Original) An integrated paper of claim 1 further including binder fibers or
2 particles.

1 7. (Original) An integrated paper of claim 1 wherein said fibrillated fibers and said
2 active agents have different settling velocities such that said integrated paper has an
3 asymmetric structure when formed by wet-laid processes.

1 8. (Cancelled)

1 9. (Previously presented) The integrated paper of claim 1 wherein said fibrillated
2 fibers have an average fiber diameter of less than about 400 nm; and
3 said active agents further being selected from silver oxide particles admixed with said
4 fibrillated fibers.

1 10. (Original) An integrated paper of claim 9 wherein the fibrillated fibers comprise a
2 liquid crystal polymer.

1 11. (Previously presented) The integrated paper of claim 1 wherein said fibrillated
2 fibers have an average fiber diameter of less than about 400 nm; and
3 said active agents further being selected from one or more acid neutralizing agents
4 admixed with said fibrillated fibers;
5 wherein said integrated paper can withstand a hot and corrosive environment of a lube
6 oil filter, and wherein said one or more acid neutralizing agents comprises magnesium
7 oxide, magnesium hydroxide, calcium sulfonate, magnesium sulfonate, calcium phenate,
8 magnesium phenate, or combinations thereof.

1 12. (Original) An integrated paper of claim 11 further including binder fibers or
2 particles.

1 13. (Cancelled)

1 14. (Previously presented) An integrated paper comprising of:

2 a plurality of lyocell fibers immobilized within and throughout said integrated paper,
3 said lyocell fibers fibrillated at a temperature greater than about 30°C, wherein
4 said fibrillated lyocell fibers have an average fiber diameter of less than or equal to
5 about 400 nm;

6 activated carbon particles admixed with said fibrillated lyocell fibers and immobilized
7 within and throughout said integrated paper, wherein said integrated paper has a
8 mean flow path of less than about 2 microns; and

9 a microbiological interception enhancing agent on at least a portion of at least some of
10 said fibrillated lyocell fibers immobilized within said integrated paper, such that,
11 said microbiological interception enhancing agent is also immobilized within and
12 resides throughout said integrated paper, said microbiological interception
13 enhancing agent comprising a biologically active metal precipitated with a counter
14 ion of a cationic material that is residing within and throughout said integrated
15 paper and on said at least portion of said fibrillated lyocell fibers to form a
16 colloidal metal precipitate within and throughout said integrated paper and on a
17 surface of said at least portion of said fibrillated lyocell fibers.

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1 15. (Cancelled)

1 16. (Original) An integrated paper of claim 14 further including a heavy metal
2 reducing agent.

1 17. (Previously presented) An integrated paper of claim 16 wherein the heavy metal
2 reducing agent comprises particles of zeolite, silicate, or combinations thereof.

1 18. (Original) An integrated paper of claim 14 further including an arsenic reducing
2 agent.

1 19. (Original) An integrated paper of claim 18 wherein the arsenic reducing agent
2 comprises particles of iron, oxides of manganese or iron, or combinations thereof.

1 20. (Previously presented) An integrated paper comprising:
2 a plurality of fibrillated fibers having an average fiber diameter of less than about 1000
3 nm immobilized within said integrated paper;
4 active agents immobilized within said integrated paper and admixed with said
5 plurality of fibrillated fibers; and
6 a microbiological interception enhancing agent on at least a portion of at least some of
7 said fibrillated fibers and/or said active agents, said microbiological interception
8 enhancing agent comprising a biologically active metal precipitated with a counter
9 ion of a cationic material that is residing on said at least portion of said fibrillated

10 fibers and/or said active agents to form a colloidal metal precipitate on surfaces
11 thereof, whereby said microbiological interception enhancing agent is
12 immobilized within and resides throughout said integrated paper since prior to
13 forming said integrated paper using said fibrillated fibers and/or said active agents,
14 said fibrillated fibers and/or said active agents are treated with said microbiological
15 interception enhancing agent,
16 wherein said integrated paper has a mean flow path of less than about 2 microns.

1 21. (Cancelled)

1 22. (Original) An integrated paper of claim 20 further including binder fibers or
2 particles.

1 23. (Cancelled)

1 24. (Previously presented) An integrated paper of claim 20 further including a carbon
2 block, wherein said integrated paper is wrapped around the carbon block.

1 25-40. (Cancelled)

1 41. (Cancelled)

1 42. (Previously presented) The integrated paper of claim 1 wherein said colloidal
2 metal precipitate includes a silver-amine-halide complex.

1 43. (Previously presented) The integrated paper of claim 1 wherein said fibrillated
2 fibers have an average diameter of less than or equal to 250 nm and a length of 1 mm to
3 about 8 mm.

1 44. (Previously presented) The integrated paper of claim 1 wherein said colloidal metal
2 precipitate is physically trapped within a matrix of said cationic material.

1 45. (Previously presented) The integrated paper of claim 1 wherein said colloidal metal
2 precipitate is bound to said cationic material.

1 46. (Previously presented) The integrated paper of claim 45 wherein said colloidal
2 metal precipitate is bound to said cationic material by adsorption.

1 47. (Previously presented) The integrated paper of claim 45 wherein said colloidal
2 metal precipitate is bound to said cationic material by electrostatic forces.